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(54)【発明の名称】 耐食性部材

(57)【要約】

【課題】パーティクルが発生されず、優れた耐食性を達成した耐食性部材を提供する。

【解決手段】基体の表面に密度 2.40 g/cm<sup>3</sup> 以上、表面粗さ Ra 0.6 μm 以下の炭化硼素膜を被覆した耐食性部材。

**ATTORNEY-CLIENT PRIVILEGED COMMUNICATION**

Tom,

Here is one of several data summaries from Japanese patent applications.

(21)Application number: **10087582**

(71)Applicant: **KYOCERA CORP**

(22)Date of filing: **31.03.1998**

(72)Inventor: **KOSHIDA MICHIEHIKO**

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**(54) CORROSION RESISTANT MEMBER**

**(57)Abstract:**

**PROBLEM TO BE SOLVED:** To obtain the corrosion resistant member of long term reliability achieving excellent corrosion resistance by covering a boron carbide film, in which a density is higher than a specified value and a surface roughness is less than a specified value, on a surface of a substrate so as not to generate a particle.

**SOLUTION:** This corrosion resistant member is made so that a surface of a substrate is covered with a boron carbide film having a density of 2.40g/cm<sup>3</sup> and a surface roughness Ra of 0.6 μm. The content of at least one of elements among boron, aluminum, iron in the boron carbide film is totally 3,100 ppm (including O). The corrosion resistant member, on the surface of which the boron carbide film of this constitution is covered is made plasmatic, under a fluorine group, a chlorine group, a halogen group corrosion gas, and by introducing a micro wave/high frequency voltage into the gas atmosphere, and excellent corrosion resistance can be attained under such plasma. Further, the substrate is constituted of a ceramic sintered body of boron carbide sintered body, AlN, Al<sub>2</sub>O<sub>3</sub>, Si<sub>3</sub>N<sub>4</sub>, SiC, etc., cermet and graphite.

Etch conditions: RIE, (1) 10Pa, 60sccm Ar + 60sccm CF<sub>4</sub>, 1kW, 3hr etch exposure  
(2) 4Pa, 100sccm BC<sub>l</sub>3, 1.8kW, 3hr exposure

	Boron carbide content (wt%)	Density	Surface roughness
N o.	炭化硼素 含有量 (重量%)	炭化硼素膜 の密度 (g / cm <sup>3</sup> )	炭化硼素膜 表面粗さ (μm)
1	9 6	2. 4 5	0. 5
2	9 8	2. 4 5	0. 5
3	9 6	2. 4 7	0. 5
4	9 6	2. 4 5	0. 2
※ 5	9 6	2. 2 0	0. 5
※ 6	9 6	2. 4 5	0. 7
※ 7	[炭化硼素膜の成膜形成なし]	B4C without coating	

※印の試料N o. は本発明の範囲外のものである。

Table 1. Material properties

No.	Fluorine plasma		Chlorine plasma	
	Etch rate (o: good    x:bad)	Particles	Etch rate (o: good    x:bad)	Particles
フッ素系プラズマ		塩素系プラズマ		
	イッティング レート Å/min	パーティクル	イッティング レート Å/min	パーティクル
1	55	○	25	○
2	52	○	23	○
3	52	○	21	○
4	50	○	20	○
※ 5	105	×	95	×
※ 6	82	×	62	×
※ 7	110	×	90	×

※印の試料No. は本発明の範囲外のものである。

Table 2. Etch behavior in F, Cl plasma

No.	Impurities (total)				Fluorine plasma		Chlorine plasma	
	Si	Al	Fe	合計量	Etch rate Å/min	パーティクル	Etch rate Å/min	パーティクル
8	800	1000	1000	2800	52	○	22	○
9	1000	800	1000	2800	51	○	21	○
10	1000	1000	800	2800	53	○	23	○
※11	1200	1000	1000	3200	103	○	93	○
※12	1000	1200	1000	3200	107	○	96	○
※13	1000	1000	1200	3200	106	○	96	○

※印の試料No.は本発明の範囲外のものである。

Table 3. Effect of impurities